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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,742	12/03/2003	Wataru Ishikawa	KON-1838	6828
20311	7590	10/18/2005	EXAMINER	
LUCAS & MERCANTI, LLP 475 PARK AVENUE SOUTH 15TH FLOOR NEW YORK, NY 10016			LEBRON, JANNELLE M	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/726,742	<b>Applicant(s)</b> ISHIKAWA, WATARU	
	<b>Examiner</b> Jannelle M. Lebron	<b>Art Unit</b> 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 8 and 9 are objected to because of the following informalities: the claim from which it depends on does not mention the claimed "oxetane compound". For the merits of this examination it was assumed claims 8 and 9 depend on claim 7. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14 and 15 are purportedly directed to a "ink-jet recording apparatus." The limitations of the claims however, are only the method steps for forming and ink-jet image. Thus the claims limitations do not define the structure of applicant's claimed apparatus.

### ***Claim Rejections - 35 USC § 101***

4. Claims 14 and 15 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are purportedly directed to an apparatus but the limitations are directed toward a method. Thus it is unclear what statutory class of invention, either apparatus or method, applicant's claims are directed to.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerry (US Patent 5,438,350) in view of Yonekubo (US Patent 6,331,040) in further view of Wu (US Patent 6,467,897).

8. Kerry discloses "a method for forming an ink-jet image, comprising the steps of:

(a) ejecting droplets of an ink through ink-nozzles [40] of an ink-jet head [10] of an ink jet recording apparatus [column 2, lines 34-38], the ink-jet head [figure 1] being provided with:

(i) a plurality of ink chambers having the ink-nozzles, each ink chamber having a dividing wall between adjacent ink chambers, the dividing wall

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containing an actuator which deforms in response to applied voltages to the adjacent chambers [column 3, lines 17-24]; and

(ii) a common ink tank which communicates with the ink chambers respectively [column 2, lines 39-40]”.

Kerry also discloses “the droplets of the ink being ejected on a recording media from the ink-nozzles by a repeated expansion and shrinking of the ink chamber, and the quiescent period being regulated so as to decrease the cross talk among the ink chambers adjacent to each other [column 3, lines 26-29].”

Thus Kerry meets the claimed invention except “the ink-jet recording apparatus being provided with a driving signal generator for continuously generating multiple driving signals applied to the actuator, the driving signal generator producing:

an expansion pulse which expands a volume of the ink chamber by deforming the actuator contained in the dividing wall of the ink chamber;

a shrinkage pulse which compresses the volume of ink chamber by deforming the actuator; and

a predetermined quiescent period between the expansion pulse and the shrinkage pulse.”

9. Yonekubo discloses a printing apparatus that includes a “driving signal generation unit [48] that generates a driving signal to each piezoelectric element of the printhead [28] [column 8, line 66 – column 9, line 2]”. In the invention, the driving signal is specified to produce a pulse “generated to include at least a first signal for expanding said pressure chamber, a second signal for keeping the

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expanded state of the pressure chamber, and a third signal for contracting said pressure chamber [column 3, lines 38-42].” It would have been obvious to one of ordinary skill in the art at the time of the invention to provide an inkjet recording apparatus that included a driving signal generator. One would have been motivated to modify Kerry to cause ink droplets to be spouted from the nozzles as taught by Yonekubo.

10. Wu discloses compositions that when cured help “improve physical properties like hardness [column 2, lines 62-63]” whereas “the energy source used for achieving polymerization of the curable functionality may be actinic [column 16, lines 35-37]” and “such functionality generally includes not only groups that cure via a cationic mechanism upon energy exposure but also groups that cure via a free radical mechanism [column 16, lines 22-25].” It would have been obvious to one of ordinary skill in the art at the time of the invention to provide an inkjet recording apparatus that radically cures the ink droplets. One would have been motivated to modify Kerry to provide excellent control over the initiation and rate of polymerization as taught by Wu.

11. Regarding claims 3 and 4, the claimed limitations are met as set forth above in claims 1 and 2, except “wherein the predetermined quiescent period between the expansion pulse and the shrinkage pulse is set so that a time difference between a center of the expansion pulses and a center the shrinkage pulses is equal to a natural vibration period of the ink in the ink chamber.” Yonekubo discloses the relationship between the first pulse and the second pulse signal that takes into account the “period of the natural vibration of the

meniscus and the natural frequency of the ink in the ink conduit [column 5, lines 41-45].”

12. Regarding claims 5 and 6, the claimed limitations are met as set forth above in claims 1 and 2, except “wherein the predetermined quiescent time between the expansion pulse and the shrinkage pulse is controlled based on a change of the ink natural vibration period produced by change of an ink temperature change, the ink temperature being detected with an ink temperature detector provided in the ink chamber.” Yonekubo discloses a sensor that measures temperature of the ink that varies “the time difference between the time of spouting an ink droplet in response to the first pulse and the start timing of the first signal of the second pulse [column 19, lines 25-28].”

13. Regarding claim 7, the claimed limitations are met as set forth above in claims 1 and 2, except “wherein the cationic polymerizable monomer contained in the ink is an oxetane compound or an epoxy compound.” Wu discloses representative examples of energy curable groups that include epoxy groups [column 16, lines 25-27].

14. Regarding claims 10 and 11, the claimed limitations are met as set forth above in claims 1 and 2, except “wherein the actinic ray is an ultraviolet ray”. Wu discloses that suitable sources of curing energy include low intensity ultraviolet light [column 16, lines 49-53].

15. Regarding claims 12 and 13, the claimed limitations are met as set forth above in claims 1 and 2, except “wherein a non ink absorptive recording material is employed on which the droplets of the ink are ejected”. Wu discloses energy

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curable inks compatible with non-porous substrates including vinyl and plastic  
[column 26, lines 46-52].

***Allowable Subject Matter***

16. Claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

18. Prior art does not disclose or suggest the "compound having an oxetane ring in which the 2- position is substituted."

19. Prior art does not disclose or suggest the "epoxidized fatty acid ester or an epoxidized fatty acid glyceride."

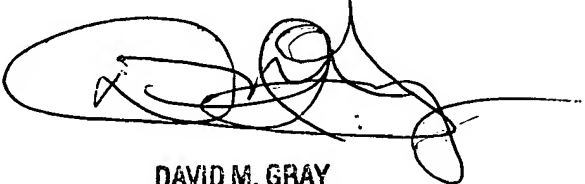
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jannelle M. Lebron whose telephone number is (571) 272-2729. The examiner can normally be reached on Monday thru Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David M. Gray can be reached on (571) 272-2119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'David M. Gray', with a long horizontal line extending to the right.

DAVID M. GRAY  
PRIMARY EXAMINER

JML